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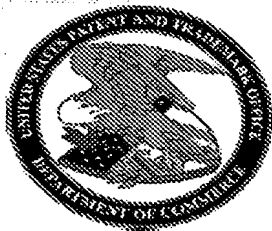
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PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

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<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheet(s) attached hereto		
TITLE OF THE INVENTION (500 characters max)		
SOCIAL NETWORK OF IDENTITIES AND QUERY METHOD THEREFOR		
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Direct all correspondence to the address for SUGHRUE MION, PLLC filed under the Customer Number listed below:		
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<input checked="" type="checkbox"/> Specification	Number of Pages 13	<input type="checkbox"/> CD(s), Number
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METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT		
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.		
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the Provisional filing fees. The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.		
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The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.		
<input checked="" type="checkbox"/> No.		
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Respectfully submitted,

SIGNATURE

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SOCIAL NETWORK OF IDENTITIES AND QUERY METHOD THEREFOR

BACKGROUND OF THE INVENTION

1. Field of the Invention

[01] The invention generally relates to computing networking. More particularly, the invention relates to a social network based on identities of individuals.

2. Description of the Related Art

[02] United States Patent Nos.: 6,345,288 and 6,088,717; the paper "From Name Service to Identity Service: How XNS Builds on the DNS Model," July 9, 2002, ([http:// www.xns.org / pages/ From_Name_to_Identity.pdf](http://www.xns.org/pages/From_Name_to_Identity.pdf)), and the "XNS Technical Specifications," July 9, 2002, ([http://www.xns.org/pages/ XNS_Technical_Specs.pdf](http://www.xns.org/pages/XNS_Technical_Specs.pdf)), describe techniques for communicating information between entities represented as identities in a computer network based on an agreement between the identities of the entities that specifies the data to be transferred and/or exchanged. These references are incorporated herein by reference.

[03] The techniques described in these references, however, do not take advantage of the social relationships that exist between people to help locate

and share information. The social network of identities described herein uses those social relationships to help people to share information.

BRIEF DESCRIPTION OF THE DRAWINGS

- [04] Fig. 1 is a physical representation of an exemplary embodiment of a plurality of computers that form a social network based on digital identities of people, entities and/or resources and relationships between those people, entities, and/or resources. Such a network is referred to as a social network of identities.
- [05] Fig. 2 is an exemplary illustration of an identity account used in the social network of Fig. 1.
- [06] Fig. 3 is a flowchart of a process for querying the social network of identities shown in Fig. 1.
- [07] Figs. 4A and 4B show examples of logical relationships within a social network of identities that are used in querying the network.
- [08] Figs. 5-7 respectively illustrate various exemplary embodiments of identity accounts having contracts therein.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

- [09] The embodiments described below are described with reference to the above drawings, in which like reference numerals designate like components.
- [10] Fig. 1 shows a plurality of computers that form a social network based on identities of resources using those computers. Those resources can include

entities, such as a person, an organization, a business, or various other types of resources. Note that the computers shown in Fig. 1 only represent one example of devices that can be used to form the social network. Other devices include, but are not limited to, PDAs and cellular communication devices.

[11] In the social network of Fig. 1, a user (USER1) using a client workstation can have an identity account 101 that resides on a computer, such as a server 100. The identity account can contain, for example, personal address information, work related information, etc.

[12] The server 100 can store and manage the identity accounts of a plurality of users. The server 100 communicates over communications networks, such as the Internet shown in Fig. 1 as a plurality of connected communication networks 110A, 110B, through 110N, with other servers, such as servers 150A through 150N. Server 150A maintains the identity account of a person (e.g., P1) whose identity account can communicate with that of USER1. Similar to the connection between server 100 associated with USER1 and server 150A associated with P1, server 150A communicates with a server 160 that holds an identity account of an individual (e.g., P2) whose identity account can communicate with that of P1.

[13] An identity account holds information about a resource such as a person, or an entity, such as an organization or group. This information describes certain attributes about the person or entity to identify the person or entity in some respect.

- [14] An exemplary embodiment of identity account 101 is conceptually illustrated in Fig. 2. Fig. 2 shows an identity account containing information about USER1, such as address information, e-mail address information, job-title, etc.
- [15] In the social network shown in Fig. 1, each identity account has a unique, persistent and immutable network identifier. An embodiment of the identifier takes the form “: HOSTID : IDENTITYID”. An example of such an identifier is “urn:xri://.10.1.2.3:238” which specifies a host address “.10.1.2.3” and a particular user or resource identifier 238 located at host address 10.1.2.3. Such an identifier can be referenced in other identities and thus the identifier can represent a link in a social network. Data, in an identity account, related to another identity account of a personal contact, e.g., P1, can also include, for example, information about the network location of the other identity account. Thus, a social network of identities, can link multiple identity accounts in the network to one another, where the links represent personal relationships that have been established between people. Such relationships can be enforced by the identity accounts using electronic contracts, or agreements, that dictate the actions one identity account may perform relative to another identity account with which it has the agreement.
- [16] Based on the social network, as described above, a user can more easily obtain information about other entities and/or persons than was previously possible. For example, the network shown in Fig. 1 allows a user,

such as USER1, to answer the question “Who do I know that directly or indirectly knows X?” (X being a person, place, or thing), after first determining that he/she does not know X. Fig. 3 shows an example of a process for making such a query. That is, at operation 110, USER 1 in the network of Fig. 1, uses a query interface, to seek the answer to the question “Who do I know that directly or indirectly knows X?” in operation 115. This inquiry can be input by way of typing, voice recognition, or by using various other well known methods of inputting information.

[17] Next, an identity account of a person P1 who USER1 knows, is accessed (120). In this example, the server 150A and identity account 151A, shown in Fig. 1, are the server and identity account of person P1. Then, the process determines whether P1 knows X either directly or indirectly. That is, the process first determines whether P1 directly knows X. If not, then the process determines whether P1 indirectly knows X, possibly through another person known to P1 whose identity account has a contract with P1’s identity account. Here, P1 knows P2 who knows X. As shown in Fig. 1, P2 is associated with server 160 and identity account 161.

[18] Finally, if it is determined that P1 indirectly or directly knows X, then the process of Fig. 3 proceeds to operation 130, where it is determined whether contractual agreements exist such that P1 is allowed to disclose that he/she indirectly or directly knows X. If it is determined that such contractual agreements exist, then the name of P1 can be displayed. However, if it is

determined that the contractual agreements do not allow P1 to disclose that he/she directly or indirectly knows X, then the process returns to operation 120. Also, as an alternative to steps 125 and 130, it can be determined whether P1 indirectly or directly knows X based on information from P1 accessible by USER1's identity account.

[19] Figs. 4A and 4B depict examples of the types of logical relationships that can exist in a social network of identities. In Fig. 4A, USER1, P1, and P2 represent identity accounts in the social network. X represents a person, place, or thing that is the subject of USER1's query "who do I know that indirectly or directly knows X", as discussed above. Contracts, or agreements, can exist between identity accounts USER1, P1, and P2. For example, at operation 130 in Fig. 3, it could be determined whether a contract between P2 and P1 exists, that enables information related to X to be passed from P2 to P1. If X is an identity account in the social network, a contract must exist between X and P2 authorizing P2 to pass information related to X to another identity account. Also, the contractual agreement between P1 and P2 and the contract between P1 and USER1 must allow for information related to X to be passed from P1 to USER1. Thus, contracts must exist between all identity accounts that communicate during a particular query in order for information to be passed from one identity account to another.

[20] Fig. 4A illustrates a logical relationship where two people P1 and P2 that each have a relationship with USER1 also have a relationship with person

X. Fig. 4B, illustrates an example of logical relationships in a social network in which only P2 has a direct relationship with X, which, for example, can be a person.

[21] Fig. 4B represents an example where USER1 knows a person P1 that can obtain information related to X only indirectly because P1 does not have a direct relationship with X. Hence there is no link shown between P1 and X in Fig. 4B. However, P1 does have a relationship with P2, who has a relationship with X. Based on contracts between P1 and P2, and P1 and USER1, USER1 can obtain information related to X based on the relationships established within the social network, as depicted in Fig. 4B.

[22] Returning to operation 125 in Fig. 3, if P1 does not directly or indirectly have a relationship with X, then the process returns to operation 120, and the identity account of the next person whose identity account has a contract with P1's identity account, is accessed to determine whether this next person directly or indirectly has relationship with X. Thus, the query process shown in Fig. 3 is a sequential process of iterating through contracts within the identity account. However, the query process is not limited to such sequential query process, and a parallel query process could be used.

[23] As an alternative embodiment to the identity account shown in Fig. 2, Fig. 5 illustrates an identity account having a plurality of contracts. Fig. 5 is similar to Fig. 2, except for the contracts contained within the identity account of Fig. 5. Contracts embody the relationships that exist between people, and

contracts exist between identity accounts used to represent people. That is, a contract defines the parameters of the relationships between the identity account of one entity and that of another entity. For example, as illustrated in Fig. 5, a contract K1 in identity account 101 of USER1 can specify whether information can be shared between another user's (e.g. P1) identity account. A conventional digital identity account contract can be extended to indicate the type of relationship that exists between the respective identity accounts. For example, if USER1 and P1 are both people, then the type of relationship can be indicated as a "person-to-person" relationship in the contract itself. Based on the type of relationship between two identity accounts, there can be common attributes in all the contracts that reflect the same type of relationship. For example, all contracts of the type "person-to-person" can be configured to allow sharing of specific information, such as address information. This, however, is only one example of an attribute that could be common to all "person-to-person" typed relationships.

- [24] The relationships between entities having identity accounts can be further qualified. For example, the people in a "person-to-person" relationship can have a personal relationship as opposed to a business relationship. Because these people have a personal relationship, a certain level of trust is implied between those people and they might be willing to share more or different types of information than if their relationship was strictly a business relationship, for example. Capturing within a contract the type of relationship

two entities share enables identity applications to better leverage those relationships to more effectively share information than in conventional identity networks.

[25] Also, as illustrated in Fig. 5, an identity account can have a plurality of contracts. Each of these contracts represent a relationship with another identity account. As discussed above, even though contracts within an identity account are different, contracts that reflect the same types of relationships between identity accounts can have common attributes. Also, the contracts between different identity accounts can reflect the different types or relationships that may exist between people and their respective identity accounts - i.e., P2 may be a personal friend and also a business colleague of P1, thus a contract between respective identity accounts of P2 and P1 can reflect both of the two above-mentioned different types of relationships.

[26] Another embodiment of an identity account is shown in Fig. 7. Fig. 7 is similar to Fig. 5, except the contracts are organized into different categories based on the types of relationships that they represent. For example, contracts K1, K2, and K4 represent relationships between identity account 101 and other identity accounts, where the other identity accounts are for other people, with whom USER1 has personal relationships. Contracts K3 and K5 represent relationships between identity account 101 and other identity accounts, where the other identity accounts are that of businesses. Contracts K6 and K7 reflect the relationships between identity account 101 and identity accounts for other

entities that share a commercial relationship with USER1. Thus, the contracts of Fig. 6 are categorized such that they respectively represent the types of relationships USER1 has with the other entities, respectively. However, unlike Fig. 5, the contracts in the identity account of Fig. 6 do not contain therein information about the types of relationships between identity accounts. Rather that information is specified by the grouping of the contracts.

[27] Similar to Figs. 5 and 6, Fig. 7 also shows an exemplary embodiment of an identity account having contracts therein. However, unlike Figs. 5 and 6, Fig. 7 includes a table 810 that indicates the types of relationships reflected in the respective contracts. For example, table 810 in Fig. 7 specifies that contracts K1, K2, and K4 reflect a person-to-person, personal relationships between identity account 101 and another identity account, contract K3 reflects a person-to-person relationship, that is a business relation, and contract KN reflects a commercial relationship.

[28] In summary, Figs. 5-7, as described above, show how identity accounts and contracts contained therein can be associated with information about the type of relationship to qualify the terms of the contract. This qualification of the type of relationship is utilized in a social network to define the parameters of relationships between identity accounts and to reflect the types of relationships that exist between particular identity accounts.

[29] Additionally, a contract within a specific identity account can be configured to allow other identity accounts with which the specific identity

account corresponds, to automatically receive information from the specific identity account when information changes therein. That is, when information in an identity account changes, this information can be propagated to other identity accounts based on the contractual terms between the respective identity accounts.

[30] For example, if address information in identity account "B" is changed, the changed information can be "pushed" to another identity account A based on a contractual obligation to push this information to identity account A when it changes and based on the type of relationship specified in the contract. The mechanisms for performing the above-described push operation can exist within the contract itself. Also, it should be recognized that the above described propagation process is only one example of a method by which information can be distributed in the social network of the present application.

[31] Having described the invention as set forth above, it is believed that other modifications, variations and changes will be suggested to those skilled in the art in view of the teachings set forth herein. It is therefore to be understood that all such variations, modifications and changes are believed to fall within the scope of the present invention as defined by the appended claims. Although specific terms are employed herein, they are used in their ordinary and accustomed manner only, unless expressly defined differently herein, and not for purposes of limitation.

WHAT IS CLAIMED IS:

1. An apparatus for participating in a computerized social network of users, comprising:

an identity account associated with a first one of the users in the social network, the identity account having information about the first user;

an electronic contract specifying information in the identity account for sharing with a second one of the users in the social network; and

means for qualifying the information specified in the identity account to be shared with the second user based a type of relationship between the first and second users.

2. The apparatus of claim 1, wherein the type of relationship between the first and second user is a personal relationship and said means for qualifying the information specified in the identity account qualifies the information to output to the second user information that is suitable for sharing in a personal relationship.

3. The apparatus of claim 1, wherein the type of relationship between the first and second user is a business relationship and said means for qualifying the information specified in the identity account qualifies the information to output to the second user information that is suitable for sharing in a business relationship.

4. A method of obtaining information about at least one entity in a social network having different identity accounts whose relationships with one another are based on electronic contractual agreements, said method comprising:

(a) requesting information related to said at least one entity;

(b) receiving said requested information related to said at least one entity based at least on a relationship established between said at least one entity and another entity having an identity account.

5. The method according to claim 4, wherein said at least entity is one of at least one person, at least one business, at least one group, and at least one organization.

6. The method according to claim 1, wherein said relationship is based on a electronic contract between said at least one entity and said another entity.

7. The method according to claim 5, wherein a type of said relationship is reflected in an electronic contract.

8. The method according to claim 6, wherein said type of said relationship comprises at least one of person-to-person, person-to-business, person-to-organization, commercial, and business.

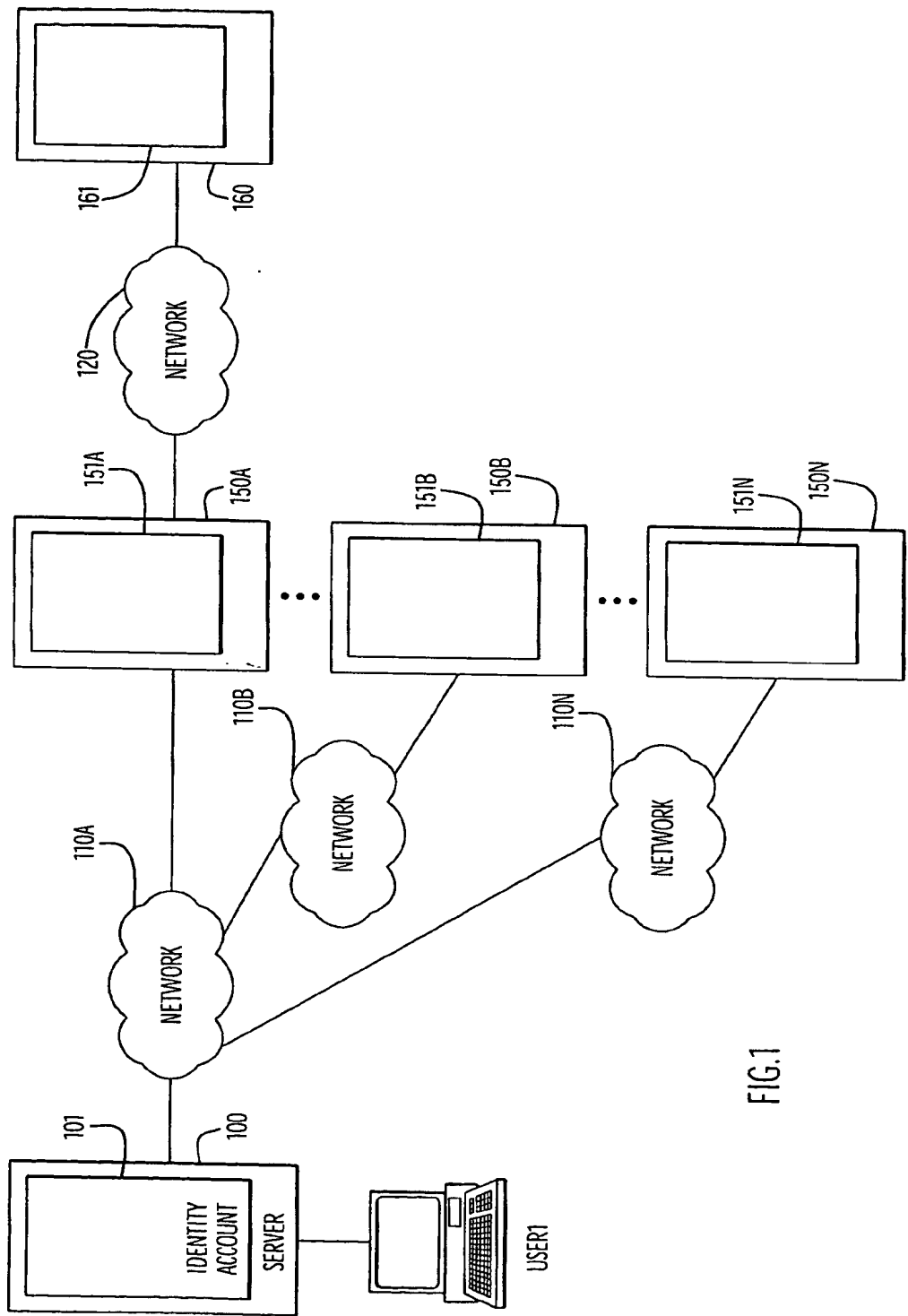
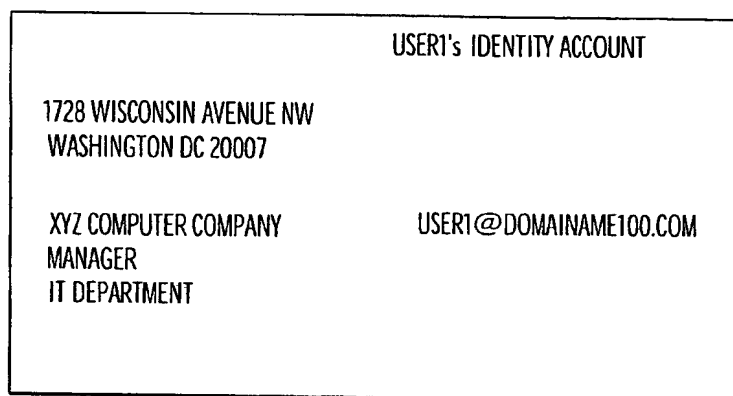


FIG.1



101

FIG.2

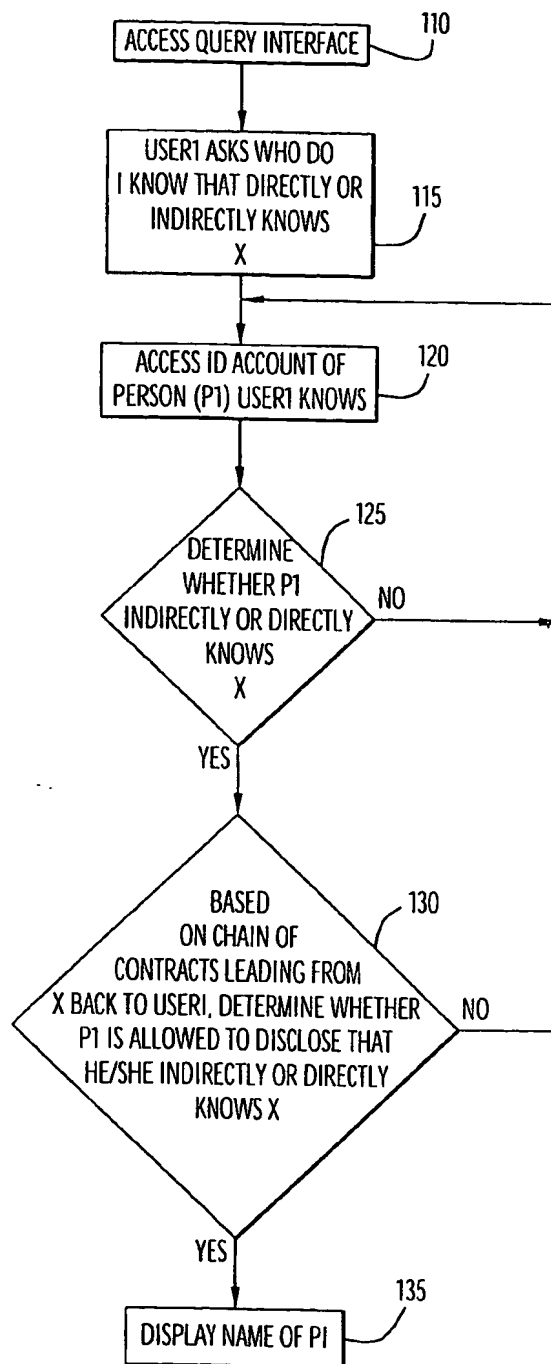
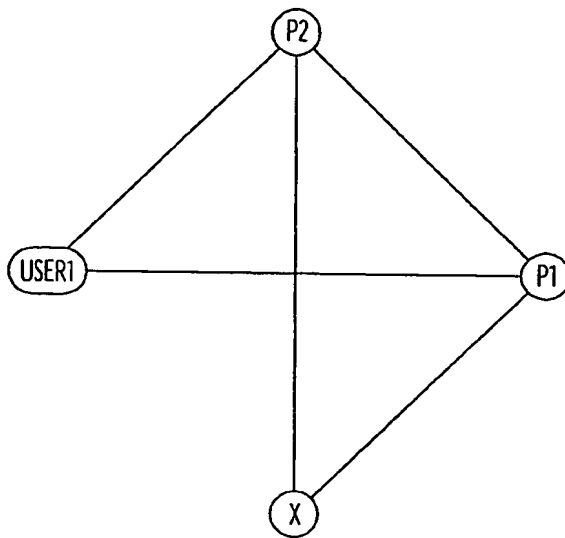


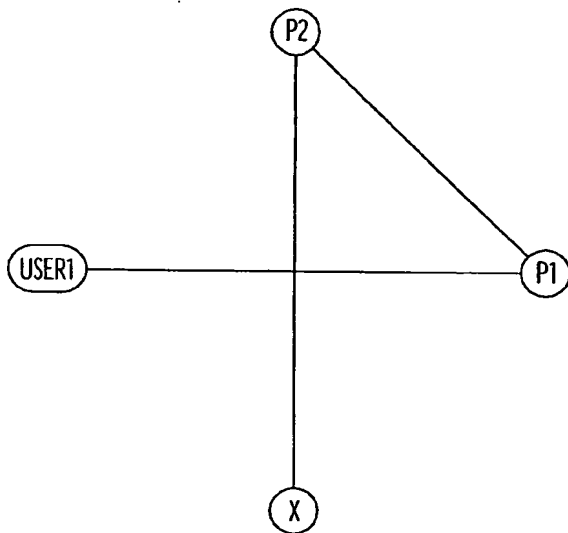
FIG.3



RELATIONSHIPS

USER1-P1
 USER1-P2
 P1-P2
 P2-X
 P1-X

FIG. 4A



RELATIONSHIPS

USER1-P1
 P1-P2
 P2-X

FIG. 4B

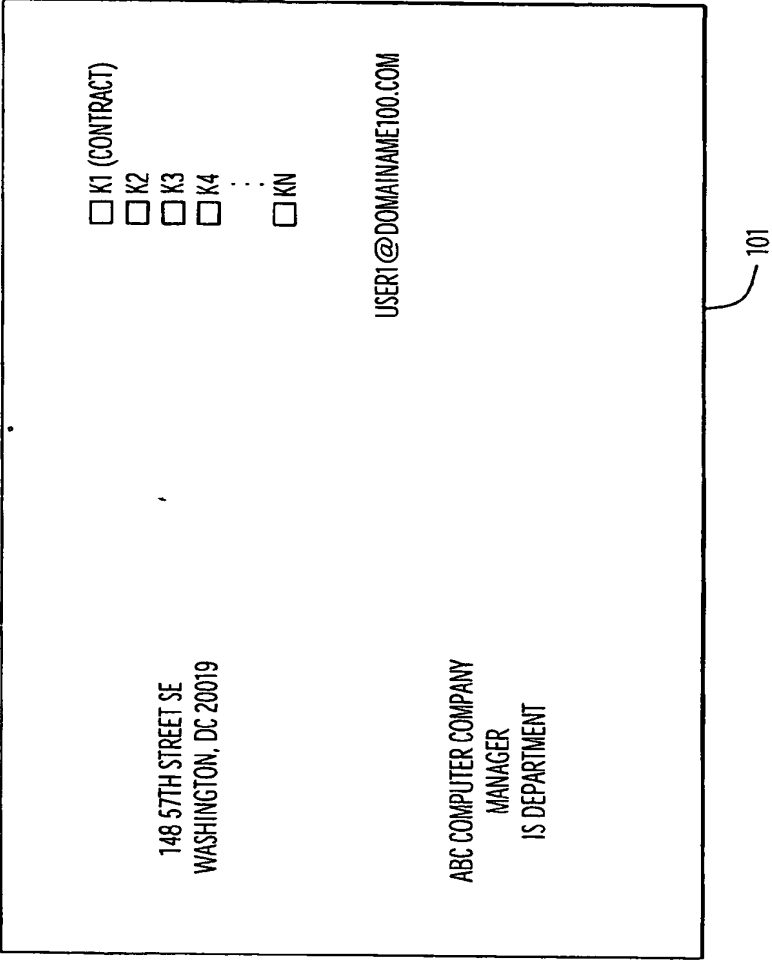


FIG.5

148 57TH STREET SE
WASHINGTON, DC 20019

PERSON TO PERSON

☐ K1 (CONTRACT)

☐ K2

☐ K4

PERSON TO BUSINESS

☐ K3

☐ K5

COMMERCIAL

☐ K3

☐ K5

ABC COMPUTER COMPANY
MANAGER
IS DEPARTMENT

USER1@DOMAINAME100.COM

FIG.6

101

148 57TH STREET SE
WASHINGTON, DC 20019

☐ K1 (CONTRACT)

☐ K2

☐ K3

☐ K4

☐ . . .

☐ KN

ABC COMPUTER COMPANY
MANAGER
IS DEPARTMENT

CONTRACT#	TYPE OF RELATIONSHIP
K1	PERSON-TO-PERSON
K2	PERSON-TO-PERSON
K3	PERSON-TO-BUSINESS
K4	PERSON-TO-PERSON
.	.
KN	COMMERCIAL

USER1@DOMAINAME100.COM

110

101

FIG.7